BROCADE VDX 8770 SWITCH

DATA CENTER

Scaling Out Brocade VCS Fabrics

HIGHLIGHTS

- Simplifies and automates network architectures to enable elastic cloud networking with Brocade VCS Fabric technology
- Enables easy scale-out of multitenant Brocade VCS fabrics with unified logical chassis management
- Provides efficiently load-balanced multipathing at Layers 1, 2, and 3, and multiple active Layer 3 gateways
- Delivers 100/40/10/1 Gigabit Ethernet (GbE) wire-speed switching with auto-trunking Inter-Switch Links (ISLs) for non-disruptive scaling
- Enables connectivity for over 1,000 server ports with scale-out fabrics, 10,000 ports with multifabrics, and 100,000 ports using multifabrics with overlays
- Simplifies Virtual Machine (VM) mobility and management with automated, dynamic port profile configuration and migration
- Is designed to support Software-Defined Networking (SDN) technologies within data, control, and management planes

Data centers continue to evolve, creating a need for infrastructure that can support growth in Virtual Machines (VMs), distributed applications, and data as well as the transition to cloud-based computing—without compromising performance. However, traditional data centers typically use inflexible, three-tier network designs that cannot efficiently manage east-west traffic or deliver the bandwidth needed to support virtualization and new services delivery. To meet these challenges, data center operators need high-performance networks that are easy to manage, can scale out on demand, and can adapt to future application requirements and network architecture approaches.

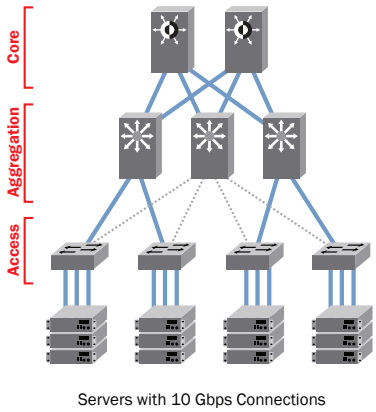
Brocade® VCS® fabrics running on the Brocade VDX® 8770 Switch allow organizations to create data center networks that just work. Together, these technologies provide unmatched automation, efficiency, and elasticity in support of the most demanding workloads—including big data, rich media, and mission-critical applications—especially in highly dynamic cloud environments. To learn more about Brocade VCS Fabric technology, visit www.brocade.com/vcs.

SCALE-OUT PERFORMANCE

The Brocade VDX 8770 Switch is designed to scale out Brocade VCS fabrics and support complex environments with dense virtualization and dynamic traffic patterns—where more automation is required for operational scalability. Available in four-slot and eight-slot versions, the Brocade VDX 8770 provides a highly scalable, low-latency 100/40/10/1 GbE modular switch.

BROCADE

Classic Hierarchical Ethernet Architecture



Ethernet Fabric Architecture

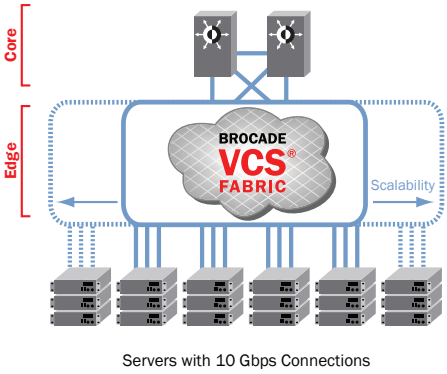


Figure 1.
Compared to classic Ethernet architectures, Ethernet fabrics—such as Brocade VCS fabrics—allow all paths to be active and provide greater scalability while reducing management complexity.

UNMATCHED SIMPLICITY AND AUTOMATION

Brocade VCS Fabric technology helps streamline network operations and speed deployment with embedded features that enable automatic configuration and management. These features include:

- **Brocade VCS Logical Chassis:** The VCS Logical Chassis feature allows organizations to manage an entire VCS fabric as a single switch. This eliminates the need to manually configure and manage each switch, simplifying management and reducing operational costs. As additional switches are added, they inherit the configuration of the fabric, allowing the network to scale out with ease. VCS Logical Chassis also simplifies ongoing operations with single-command firmware updates, centralized monitoring, and troubleshooting. For more information, read *An Overview of Brocade VCS Logical Chassis*.
- **Self-forming and self-healing fabric:** Configuration is simplified with self-forming fabrics. Configuration and device information is known by all switches, allowing switches to be added or removed, and physical or virtual servers to be relocated—without the fabric requiring manual reconfiguration. In addition, fabrics are self-healing, which increases network resilience. The fabric redirects traffic if a link fails, helping to ensure uninterrupted traffic flow and prevent data loss.
- **A reliable foundation for software-defined networks:** The Brocade VDX 8770 is hardware-enabled with the flexibility to support emerging SDN protocols. Logical Chassis technology and northbound APIs can provide operationally scalable management and access to emerging management frameworks such as OpenStack. To learn more, read *Brocade VCS Fabrics: The Foundation for Software-Defined Networks*.

MAXIMUM EFFICIENCY

Brocade VCS Fabric technology provides the foundation for a flexible and responsive network infrastructure while delivering maximum efficiency.

Traditional data centers use a rigid, three-tier tree topology in which traffic travels north to south. This compromises performance, increases latency, and creates bottlenecks. The shift to server virtualization and distributed applications has created a need for higher throughput and lower latency network designs. The Brocade VCS fabric flattens today's networks into a flexible mesh topology optimized for east-west traffic and greater efficiency.

Deliver Multitenant Cloud Data Centers

In addition, public and private cloud providers need to deploy and support distributed virtualized workloads quickly, securely, and in a scalable manner on a per-tenant basis. Traditional VLANs can be used for this purpose up to a point, but limitations on VLAN ID scale and the complexity of configuring large numbers of VLANs restrict their usefulness in larger data centers. The VCS Virtual Fabric feature of Brocade VCS Fabric technology is designed to address the scalability restrictions of traditional VLANs used for multitenant segmentation. It provides native secure multitenant support for both physical and virtual application deployments. Managed centrally through Brocade VCS Logical Chassis, the VCS Virtual Fabric feature simplifies and accelerates application deployment, and ensures policy consistency for each tenant regardless of how application components are distributed across the data center. VXLAN and VRF Lite are other options for network segmentation. To learn more, read *Multitenancy Options in Brocade VCS Fabrics*.

Multiple Load-Balanced Paths at Layers 1–3

Brocade VCS Fabric technology enables highly elastic Layer 2 and Layer 3 domains with extremely efficient load balancing and multiple active Layer 3 gateways, in addition to Layer 2 Equal Cost Multi-Path (ECMP) and Brocade ISL Trunking. In the event of a failure, traffic is automatically routed to the closest path, providing higher resilience and greater application uptime. Multilayer multipathing helps improve network utilization, reduce latency, and increase overall network performance. Read the white paper *Setting a New Standard for Network Efficiency with VCS Fabric Multilayer Multipathing Capabilities* to learn more.

Optimized for Virtualization

Brocade VCS Fabric technology offers unique features to support virtualized server and storage environments, including:

- **Brocade VM-Aware Network Automation:** Brocade VM-Aware Network Automation provides secure connectivity and full visibility to virtualized server resources through dynamic learning and activation of port profiles. By communicating directly with VMware vCenter, it eliminates manual configuration of port profiles and supports VM mobility across VCS fabrics within the data center.
- **Automatic Migration of Port Profiles:** During a VM migration, network switch ports must be dynamically configured to ensure that the VM traffic experiences consistent policies and configurations. The Brocade Automatic Migration of Port Profiles (AMPP) feature enables a seamless migration, since the VCS fabric is aware of port profiles and automatically tracks them as they move. Implemented in a

hypervisor-agnostic manner, port profiles and MAC address mapping are created on any switch in the fabric. This mapping provides the logical flow for traffic from the source port to the destination port. As a VM migrates, the destination port in the fabric learns of the MAC address move and automatically activates the port profile configuration within a single fabric or across separate fabrics.

ELASTICITY, SCALABILITY, AND FLEXIBILITY FOR VCS FABRICS

Brocade VCS fabrics provide considerable elasticity compared to both traditional Ethernet networks and competitive Ethernet fabric solutions. Organizations can start with small VCS fabrics and scale out the fabric as their needs dictate, adding or removing nodes easily and non-disruptively.

Brocade VCS fabrics easily scale out to optimize the performance of virtualized and clustered applications of all types, including big data, rich media, and mission-critical enterprise applications. In addition, the VCS fabric architecture is designed for flexible policy and services management of physical and logical networks together.

DESIGNED FOR THE MOST DEMANDING DATA CENTER NETWORKS

The Brocade VDX 8770 delivers a high-performance switch to support the most demanding data center networking needs. Key features include:

- Line-rate support for 1, 10, 40, and 100 GbE to satisfy current and future needs
- Packet forwarding performance of up to 11.42 billion packets per second
- 4 Tbps per slot line-rate design for substantial capacity and headroom
- 4-microsecond latency to assure rapid response for latency-sensitive applications
- Support for up to 384,000 MAC addresses per fabric for extensive virtualization scalability
- Multi-core CPUs within each line card to support two separate Brocade Network OS instances for high availability
- Efficient multipathing technology and vLAGS to allow extremely large-scale deployments with the best-possible network utilization
- The flexibility to deploy data center networks ranging from hundreds of server ports using scale-out fabrics to over 100,000 ports using multifabrics with overlays

A Choice of Chassis with Multiple Line Cards

The flexible, modular switch design offers interconnection with other Brocade VDX 8770 Switches; Brocade VDX 6710, 6720, 6730, and 6740 fabric switches; traditional Ethernet switch infrastructures; and direct server connections. Modular four-slot and eight-slot chassis options are available to match the switch to the needs of the organization. These include:

- **Brocade VDX 8770-4:** Supports up to 192 10 GbE ports, 108 40 GbE ports, 24 100 GbE ports
- **Brocade VDX 8770-8:** Supports up to 384 10 GbE ports, 216 40 GbE ports, 48 100 GbE ports

The Brocade VDX 8770 supports a variety of wire-speed line cards to offer maximum flexibility in terms of port bandwidth as well as cable and connector technology:

- **1 GbE:** 48×1 GbE line card provides up to 48 SFP/SFP-copper ports
- **10 GbE:** 48×10 GbE line card provides up to 48 SFP+ ports
- **10 GbE-T:** 48×10 GbE line card provides up to 48 RJ45 ports
- **40 GbE:** 12×40 GbE line card provides up to 12 40 GbE QSFP ports
- **40 GbE:** 27×40 GbE line card provides up to 27 40 GbE QSFP ports
- **100 GbE:** 6×100 GbE line card provides up to 6 100 GbE CFP2 ports

Aggregation and Migration for Traditional Ethernet Environments

Organizations utilizing traditional Ethernet technology need sensible ways to scale and expand their networks, while enabling seamless migration to fabric-based technologies to support advanced virtualization. For organizations with traditional hierarchical Ethernet environments, the Brocade VDX 8770:

- Aggregates multiple traditional access-tier switches in an aggregation-tier fabric, with efficient multipathing capabilities at multiple layers to insulate core switches from unnecessary traffic
- Provides access-layer fabric capabilities in end-of-row or middle-of-row configurations
- Establishes a migration path for organizations to adopt and grow resilient and scalable Brocade VCS fabrics

PROACTIVE MONITORING AND SYSTEM HEALTH

Brocade Fabric Watch is an innovative switch health monitoring feature available on all Brocade VDX switches. Fabric Watch monitors the health of certain switch components and, based on the threshold set, declares each component as marginal or down.

In addition, the Brocade VDX 8770 provides high availability at the line card level, an industry first. Line-card high availability allows the multi-core CPU within each line card to support two separate Brocade Network OS instances in an active/standby configuration. This enables hitless failover within each line card of the chassis. Even during an In-Service Software Upgrade (ISSU), there is no disruption because the line card does not need to completely restart while trying to sync with the new code version.

SUPPORT FOR CURRENT AND FUTURE APPLICATION NEEDS

The Brocade VDX 8770 can be used to build a variety of VCS fabric topologies to support a wide range of scale and application requirements. Architectural options include:

- **Small-scale VCS fabrics:** Can collapse access and aggregation tiers using the Brocade VDX 8770 as a port-dense, middle-of-row/end-of-row access switch
- **Medium-scale VCS fabrics:** Can utilize the Brocade VDX 8770 as a spine switch in combination with Brocade VDX 6710, 6720, 6730, and 6740 leaf switches to build highly scalable Layer 2 domains, complete with automatic and secure support for VM mobility
- **Large-scale VCS fabrics:** Can use the Brocade VDX 8770 homogeneously as both a leaf and spine switch or to aggregate multiple access-tier switches in full or partially meshed fabric domains with a logically flat network topology

The Brocade VDX 8770 and Brocade VCS fabrics offer benefits for today's most

compelling and demanding applications, including:

- **Rich media:** Service providers and cloud providers require support for significant east-west traffic within their data centers, along with support for large numbers of VMs and VM mobility. Content providers with applications such as video on demand require support for significant amounts of north-south traffic. The Brocade VDX 8770 and Brocade VCS fabrics are ideal for these applications, as they provide a low-latency, cut-through architecture and considerable throughput to enable balanced east-west and north-south traffic performance.
- **Big data:** To realize business benefits from their unstructured data, organizations require seamless access to both compute and storage resources. High-performance computing environments process large amounts of data that drive significant east-west traffic patterns and require low latency for IPC interconnection. Big data has emerged as a critical technology trend, and the Brocade VDX 8770 provides key advantages such as high-performance, line-rate 10 GbE, 40 GbE, and 100 GbE.
- **Mission-critical applications:** A wide variety of data center, cloud, and enterprise applications can take advantage of the Brocade VDX 8770, including ERP, Virtual Desktop Infrastructure (VDI), and collaboration applications such as Microsoft Exchange and SharePoint. The virtualization-aware networking characteristics of the Brocade VDX 8770 and Brocade VCS fabrics, along with high-availability and essential security functionality, help ensure that critical data services function as intended while protecting vital data from corruption or loss.

EASE OF USE AUGMENTED BY BROCADE NETWORK ADVISOR

Brocade Network Advisor is an easy-to-use network management platform for advanced management of Brocade VCS fabrics and Brocade VDX switches across the entire network lifecycle. Organizations can use Brocade Network Advisor to manage a VCS fabric as a single entity or to drill down to individual Brocade VDX switches for fault, inventory, or performance management—and to manage multiple VCS fabrics in parallel.

Brocade Network Advisor also provides simplified management of AMPP configurations, and integrity checks can be performed across physical Brocade VDX configurations, either in the same fabric or across different VCS fabrics. In addition, Brocade Network Advisor enables VM-level monitoring and can help identify top-talker applications leveraging sFlow across the fabric. Finally, Brocade Network Advisor provides VCS fabric diagnostics, including visualization of VCS fabric traffic paths and network latency monitoring that enables fault isolation via hop-by-hop inspection. For details, visit www.brocade.com/management.

BROCADE GLOBAL SERVICES

Brocade Global Services has the expertise to help organizations build scalable, and efficient cloud infrastructures. Leveraging 15 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, and education services, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

AFFORDABLE ACQUISITION OPTIONS

Brocade Capital Solutions helps organizations easily address their IT requirements by offering flexible network acquisition and support alternatives. Organizations can select from purchase, lease, Brocade Network Subscription, and Brocade Subscription Plus options to align network acquisition with their unique capital requirements and risk profiles. To learn more, visit www.Brocade.com/CapitalSolutions.

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, please contact a Brocade sales partner or visit www.brocade.com.

BROCADE VDX 8770 FEATURE OVERVIEW

	Brocade VDX 8770-4	Brocade VDX 8770-8
Port-to-port latency (64 byte packets)	<4 microseconds	<4 microseconds
Form factor	8U	15U
Slots	4	8
Dimensions and weight	Width: 43.74 cm (17.22 in.) Height: 34.7 cm (13.66 in.) Depth: 66.04 cm (26 in.) Weight: 31.75 kg (70 lb) Weight (fully loaded): 86.18 kg (190 lb)	Width: 44 cm (17.32 in.) Height: 66.2 cm (26.06 in.) Depth: 66.04 cm (26 in.) Weight: 61.24 kg (135 lb) Weight (fully loaded): 165.55 kg (365 lb)
1 GbE SFP/SFP-copper ports	192	384
10 GbE SFP+/RJ45 ports	192	384
40 GbE QSFP+ ports	108	216
100 GbE CFP2 ports	24	48
Power supplies	4 max	8 max
Cooling fans	2	4
Airflow	Side-to-back airflow, with front-to-back duct converter option	Front-to-back airflow

BROCADE VDX 8770 SPECIFICATIONS

Scalability Information*	
Connector options	1 GbE copper SFP options 10 Gbps SFP+ options: 1/3/5 m direct-attached copper (Twinax) 10 GbE SR and 10 GbE LR 10 GbE 10GBASE-T RJ45 40 GbE QSFP+ 100 GbE CFP2
Maximum VLANs	4,096
Maximum MAC addresses	384,000
Maximum IPv4 routes	352,000
Maximum IPv6 routes	88,000
Maximum ACLs	57,000
Maximum port profiles (AMPP)	1,024
Maximum ARP entries	128,000
Maximum members in a standard LAG	64
Maximum switches in a VCS fabric	32
Maximum ECMP paths in a VCS fabric	16
Maximum trunk members for VCS fabric ports	16
Maximum switches across which a vLAG can span	8
Maximum members in a vLAG	64
Maximum jumbo frame size	9,216 bytes
DCB Priority Flow Control (PFC) classes	8

Brocade VDX 8770 Modules and Line Cards	
Management Module (half-slot)	• Multicore processor • 8 GB SDRAM, USB port • Console, management port, auxiliary service port (all RJ-45)
1 GbE access (fiber/copper) line card	• 48-port SFP/SFP-copper
1 GbE/10 GbE access (copper) line card	• 48-port RJ45
10 GbE access or aggregation line card	• 48-port SFP+ (10 GbE/1 GbE) • 48-port RJ45 (10 GbE/1 GbE)
40 GbE aggregation line card	• 12-port QSFP+ module • 27-port QSFP+ module
100 GbE aggregation line card	• 6-port CFP2 module

General		
Operating system	Brocade Network OS 4.1.0	
Layer 2 switching features	• MAC Learning and Aging • Static MAC Configuration • Link Aggregation Control Protocol (LACP) 802.3ad/802.1AX • Virtual Local Area Networks (VLANs) • VLAN Encapsulation 802.1Q • Layer 2 Access Control Lists (ACLs) • Private VLANs • Edge Loop Detection (ELD) • Uni-Directional Link Detection (UDLD) • Pause Frames 802.3x	• Address Resolution Protocol (ARP) RFC 826 • IGMP v1/v2 Snooping • Pause Frames 802.3x • Multiple Spanning Tree Protocol (MSTP) 802.1s • Rapid Spanning Tree Protocol (RSTP) 802.1w • Per-VLAN Spanning Tree (PVST+/PVRST+) • STP Root Guard • STP PortFast • BPDU Guard, BPDU Filter • BUM Storm Control
Layer 3 features	• OSPF • BGP • DHCP Snooping • Static routes	• Multicast: PIM-SM, IGMP v3 • VRF lite • VRF-aware OSPF, VRRP, and static routes • VRRP-E
Brocade VCS Fabric technology features	• Automatic Fabric Formation • DHCP Option 66/67 (Auto Fabric Provisioning) • VM-Aware Network Automation • Distributed Fabric Services • Transparent LAN Services • Virtual Link Aggregation Group (vLAG) spanning multiple physical switches	• Distributed Configuration Management • Transparent Interconnection of Lots of Links (TRILL) • Equal Cost Multi-Path (ECMP)
Multitenancy and virtualization features	• TRILL FGL-based VCS Virtual Fabric • Protocol-agnostic overlay support	• Automatic Migration of Port Profiles (AMPP) • VM-Aware Network Automation

* Please refer to the latest version of the release notes for the most up-to-date scalability numbers supported in software.

BROCADE VDX 8770 SPECIFICATIONS (CONTINUED)

DCB features	• Priority-based Flow Control (PFC) 802.1Qbb • Enhanced Transmission Selection (ETS) 802.1Qaz	• Data Center Bridging eXchange (DCBX) • DCBX Application Type-Length-Value (TLV) for FCoE and iSCSI
FCoE features	• Multihop Fibre Channel over Ethernet (FCoE); requires Brocade VCS Fabric technology • FC-BB5-compliant Fibre Channel Forwarder (FCF) • FIP Snooping Bridge connectivity support • Native FCoE forwarding	• End-to-end FCoE (initiator to target) • FCoE Initialization Protocol (FIP) v1 support for FCoE devices login and initialization • Name Server-based zoning
IP storage	Auto NAS (QoS for NAS traffic)	
Quality of Service (QoS)	• Eight priority levels for QoS • Class of Service (CoS) 802.1p • DSCP Trust • DSCP to CoS Mutation • DSCP to Traffic Class Mutation • DSCP to DSCP Mutation	• Random Early Discard (RED) • Per-port QoS configuration • Scheduling: Strict Priority (SP), Shaped Deficit Weighted Round-Robin (SDWRR) • ACL-based Rate Limiting • ACL-based QoS
High availability	• ISSU • Management Module Failover	
Management		
Management and monitoring	• IPv4/IPv6 management • Industry-standard Command Line Interface (CLI) • Link Layer Discovery Protocol (LLDP) IEEE 802.1AB • MIB II RFC 1213 MIB • Switch Beaconing • Logical chassis management • Switched Port Analyzer (SPAN) • Remote SPAN (RSPAN) • Telnet	• SNMP v1/v2C, v3 • sFlow RFC 3176 • RMON-1, RMON-2 • NTP • Management Access Control Lists (ACLs) • Role-Based Access Control (RBAC) • Fabric Watch monitoring and notification • Netconf API • Brocade VCS Plugin for OpenStack
Security	• Port-based Network Access Control 802.1X • RADIUS • TACACS+	• Secure Shell (SSHv2) • BPDU Drop • Lightweight Directory Access Protocol (LDAP)
Mechanical		
Enclosure	19-inch EIA-compliant; power from port side	
Environmental		
Temperature	Operating: 0°C to 40°C (32°F to 104°F) Non-operating and storage: –25°C to 70°C (–13°F to 158°F)	
Humidity	Operating: 10% to 85% non-condensing Non-operating and storage: 10% to 90% non-condensing	
Altitude	Operating: Up to 3,000 meters (9,842 feet) Non-operating and storage: Up to 12 kilometers (39,370 feet)	
Airflow	Brocade VDX 8770-4 Maximum: 675 CFM Nominal: 200 CFM Brocade VDX 8770-8 Maximum: 1250 CFM Nominal: 375 CFM	
Power		
Max power utilization†	Brocade VDX 8770-4: 3,250 W Brocade VDX 8770-8: 6,387 W	
Power inlet	C19	
Input voltage	200 to 240 VAC (Operating voltage range: 180 to 264 VAC)	
Input line frequency	50/60 Hz	
Maximum current	AC: 16.0 A max. per power supply DC: 70.0 A max per power supply	

† Delivered power based on fully populated system with 10 GbE ports.

Safety Compliance

- UL 60950-1 Second Edition
- CAN/CSA-C22.2 No. 60950-1 Second Edition
- EN 60950-1 Second Edition
- IEC 60950-1 Second Edition
- AS/NZS 60950-1

EMC

- 47CFR Part 15 (CFR 47) Class A
- AS/NZS CISPR22 Class A
- CISPR22 Class A
- EN55022 Class A
- ICES003 Class A
- VCCI Class A
- EN61000-3-2
- EN61000-3-3
- KN22 Class A

Immunity

- EN55024
- CISPR24
- EN300386
- KN 61000-4 series

Environmental Regulatory Compliance

- RoHS-compliant (with lead exemption) per EU Directive 2002/95/EC
- NEBS-compliant

Standards Compliance

The Brocade VDX 8770 products conform to the following Ethernet standards:

- IEEE 802.3ad Link Aggregation with LACP
- IEEE 802.3 Ethernet
- IEEE 802.3ae 10G Ethernet
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1p Class of Service Prioritization and Tagging
- IEEE 802.1v VLAN Classification by Protocol and Port
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- IEEE 802.3x Flow Control (Pause Frames)
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree
- IEEE 802.1w Rapid Reconfiguration of Spanning Tree Protocol

The following draft versions of the Data Center Bridging (DCB) and Fibre Channel over Ethernet (FCoE) standards are also supported on the Brocade VDX 8770:

- IEEE 802.1Qbb Priority-based Flow Control
- IEEE 802.1Qaz Enhanced Transmission Selection
- IEEE 802.1 DCB Capability Exchange Protocol (Proposed under the DCB Task Group of IEEE 802.1 Working Group)
- FC-BB-5 FCoE (Rev 2.0)

RFC Support

RFC 768	User Datagram Protocol (UDP)
RFC 783	TFTP Protocol (revision 2)
RFC 791	Internet Protocol (IP)
RFC 792	Internet Control Message Protocol (ICMP)
RFC 793	Transmission Control Protocol (TCP)
RFC 826	ARP
RFC 854	Telnet Protocol Specification
RFC 894	A Standard for the Transmission of IP Datagram over Ethernet Networks
RFC 959	FTP
RFC 1027	Using ARP to Implement Transparent Subnet Gateways (Proxy ARP)
RFC 1112	IGMP v1
RFC 1157	Simple Network Management Protocol (SNMP) v1 and v2
RFC 1305	Network Time Protocol (NTP) Version 3
RFC 1492	TACACS+
RFC 1519	Classless Interdomain Routing (CIDR)
RFC 1584	Multicast Extensions to OSPF
RFC 1765	OSPF Database Overflow
RFC 1812	Requirements for IP Version 4 Routers
RFC 1997	BGP Communities Attribute
RFC 2068	HTTP Server
RFC 2131	Dynamic Host Configuration Protocol (DHCP)
RFC 2154	OSPF with Digital Signatures (Password, MD-5)
RFC 2236	IGMP v2
RFC 2267	Network Ingress Filtering
RFC 2328	OSPF v2 (edge mode)
RFC 3768	VRRP
RFC 2370	OSPF Opaque Link-State Advertisement (LSA) Option—Partial Support
RFC 2385	Protection of BGP Sessions with the TCP MD5 Signature Option
RFC 2439	BGP Route Flap Damping
RFC 2474	Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers
RFC 2571	An Architecture for Describing SNMP Management Frameworks
RFC 2865	Remote Authentication Dial In User Service (RADIUS)
RFC 3101	The OSPF Not-So-Stubby Area (NSSA) Option

RFC Support (Continued)	
RFC 3176	sFlow
RFC 3137	OSPF Stub Router Advertisement
RFC 3392	Capabilities Advertisement with BGPv4
RFC 4510	Lightweight Directory Access Protocol (LDAP): Technical Specification Road Map
RFC 4271	BGPv4
RFC 4292	IP Forwarding MIB
RFC 4293	Management Information Base for the Internet Protocol (IP)
RFC 3411	An Architecture for Describing SNMP Frameworks
RFC 3412	Message Processing and Dispatching for the SNMP
RFC 3413	Simple Network Management Protocol (SNMP) Applications
RFC 2460	Internet Protocol, Version 6 (v6) Specification (on management interface)
RFC 2464	Transmission of IPv6 Packets over Ethernet Networks (on management interface)
RFC 2474	Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers (only for IPv4)
RFC 4456	BGP Route Reflection
RFC 4601	Protocol Independent Multicast—Sparse Mode (PIM-SM): Protocol Specification (Revised)
RFC 4893	BGP Support for Four-Octet AS Number Space

BROCADE VDX 8770 ORDERING INFORMATION

SKU	Description
BR-VDX8770-4-BND-AC	4-slot chassis with three Switch Fabric Modules, one Management Module, two fans, two 3,000 W power supply units AC
BR-VDX8770-4-BND-DC	4-slot chassis, three Switch Fabric Modules, one Management Module, two fans, two 3,000 W power supply units DC
BR-VDX8770-8-BND-AC	8-slot chassis, six Switch Fabric Modules, one Management Module, four fans, three 3,000 W power supply units AC
BR-VDX8770-8-BND-DC	8-slot chassis, six Switch Fabric Modules, one Management Module, four fans, three 3,000 W power supply units DC
XBR-VDX8770-4	4-slot chassis, no Switch Fabric Modules, no Management Modules, two fans, no power supply units
XBR-VDX8770-8	8-slot chassis, no Switch Fabric Modules, no Management Modules, four fans, no power supply units
BR-VDX8770-48X1G-SFP-1	48×1 GbE, SFP module, no optics
BR-VDX8770-48X10G-SFPP-1	48×10 GbE, SFP+ module, no optics
BR-VDX8770-48X10G-T-1	48×10 GbE, RJ45 module, no optics
BR-VDX8770-12X40G-QSFP-1	12×40 GbE, QSFP+ module, no optics
BR-VDX8770-27X40G-QSFP-1	27×40 GbE, QSFP+ module, no optics
BR-VDX8770-6X100G-CFP2-1	6×100 GbE, CFP2 module, no optics
BR-VDX8770-MM-1	Management Module
BR-VDX8770-SFM-1	Switch Fabric Module
XBR-FAN-FRU	Fan FRU for 4- and 8-slot chassis
XBR-ACPWR-3000	3,000 W power supply unit AC
XBR-DCPWR-3000	3,000 W power supply unit DC
BR-VDX8770-LIC-FCOE	FCoE feature chassis license
BR-VDX8770-LIC-VCS	VCS feature chassis license
BR-VDX8770-LIC-LAYER3	Layer 3 feature chassis license
BR-VDX8770-LIC-ADV	Advanced feature chassis license (includes Layer 3, FCoE, and VCS licenses)
BR-VDX8770-LIC-UPG	Upgrade license from VCS, FCoE, or Layer 3 features to Advanced license

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